

NAME:

DATE:

## Unit-2 Mastery Assessment (version 646)

### Question 1 (10 points)

Let  $f$  represent a function. If  $f[33] = 4$ , then there exists a knowable solution to the equation below.

$$y = 2 \cdot (f[3x - 21] + 16)$$

Find the solution.

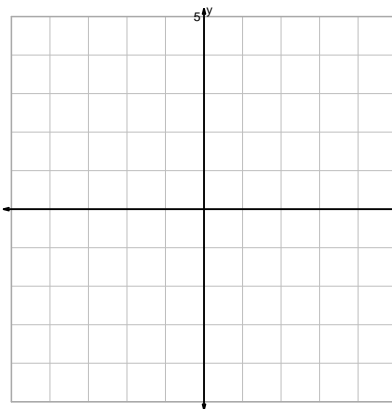
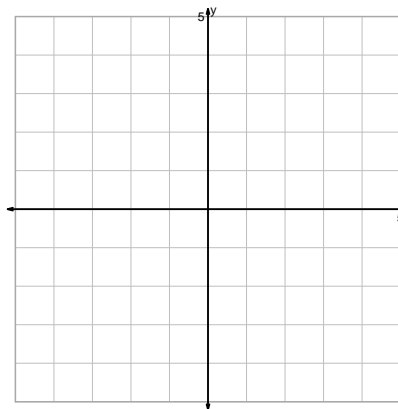
$$x =$$

$$y =$$

### Question 2 (20 points)

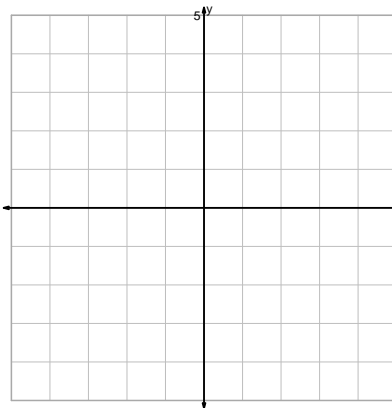
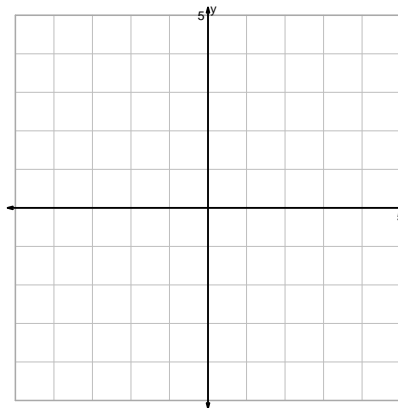
Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

$$y = 2^x - 2$$



$$y = \left(\frac{x}{2}\right)^2$$

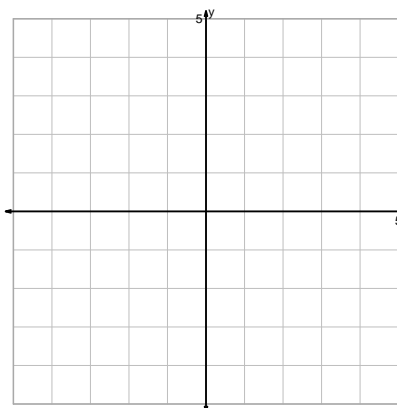
$$y = 2 \cdot \log_2(x)$$



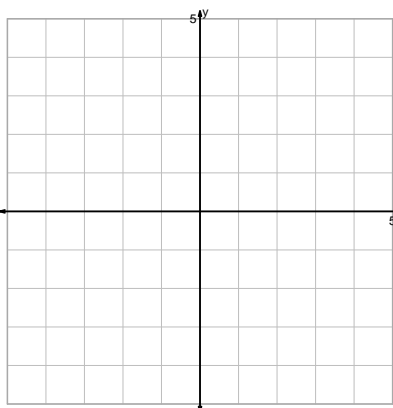
$$y = (x + 2)^3$$

Question 2 continued...

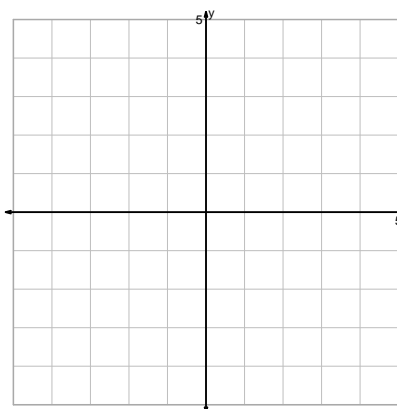
$$y = (2x)^2$$



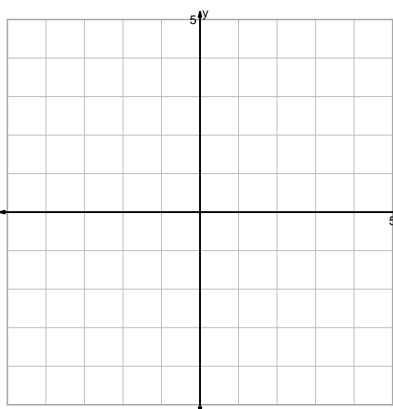
$$y = \sqrt[3]{x} + 2$$



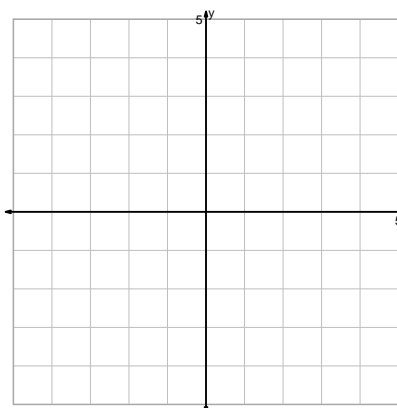
$$y = 2^{-x}$$



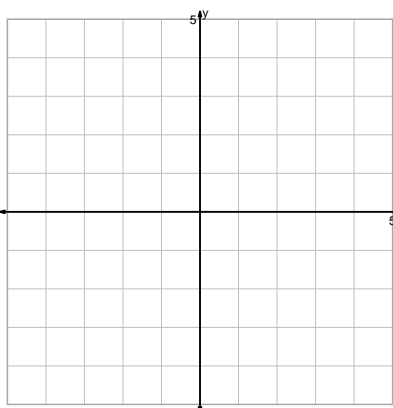
$$y = \frac{\sqrt[3]{x}}{2}$$



$$y = -\sqrt{x}$$

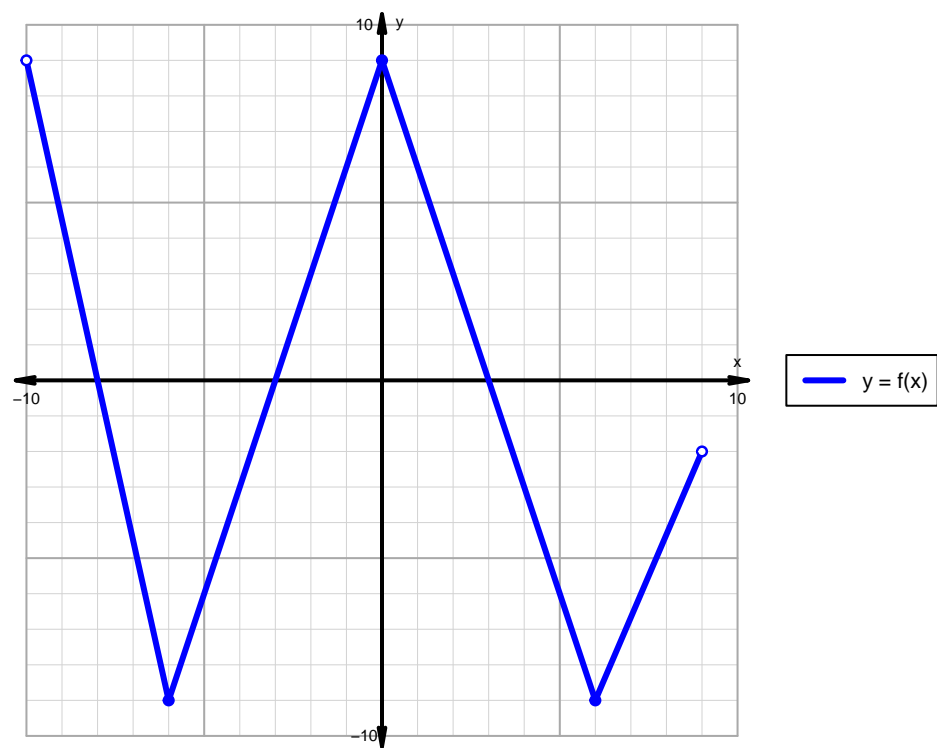


$$y = \sqrt{x-2}$$



Question 3 (20 points)

A function is graphed below.



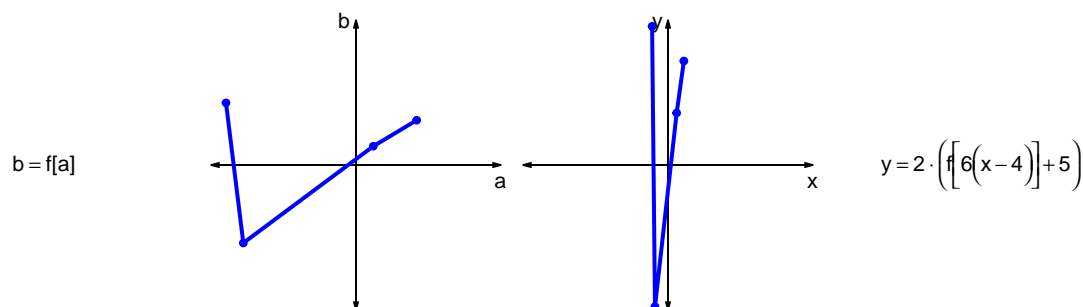
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

**Question 4 (20 points)**

Let  $f$  represent a function. The curves  $b = f[a]$  and  $y = 2 \cdot (f[6(x - 4)] + 5)$  are represented below in a table and on graphs.

a	b	x	y
-90	43	-11	96
-78	-54	-9	-98
12	13	6	36
42	31	11	72



- Write formulas for calculating  $x$  from  $a$  and calculating  $y$  from  $b$ . (Or, write the coordinate transformation formula.)
- What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve  $y = f[x]$  into the second curve  $y = 2 \cdot (f[6(x - 4)] + 5)$ ?

**Question 5 (10 points)**

A parent square-root function is transformed in the following ways:

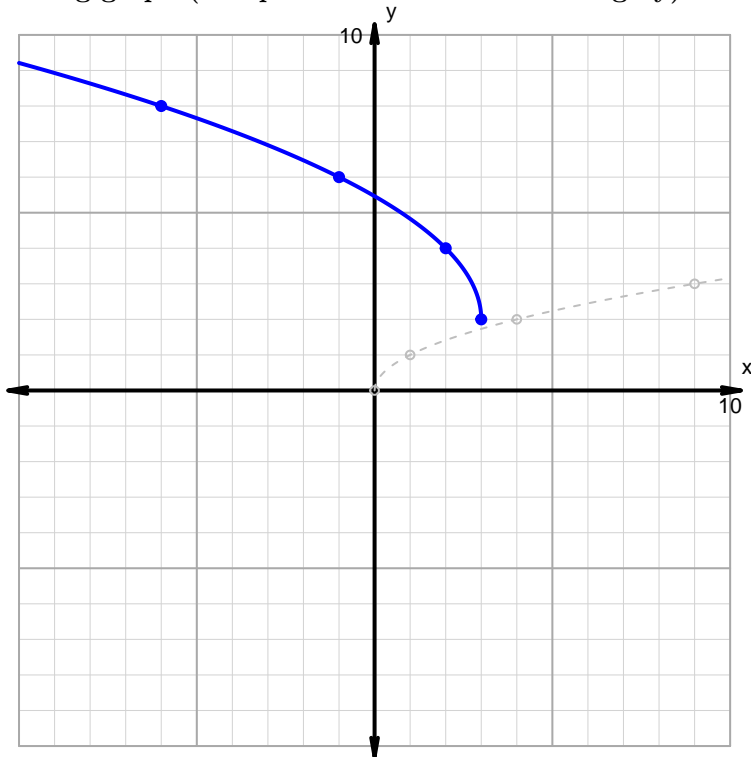
**Horizontal transformations**

1. Horizontal reflection over  $y$  axis.
2. Translate right by distance 3.

**Vertical transformations**

1. Translate up by distance 1.
2. Vertical stretch by factor 2.

**Resulting graph (and parent function in dashed grey):**

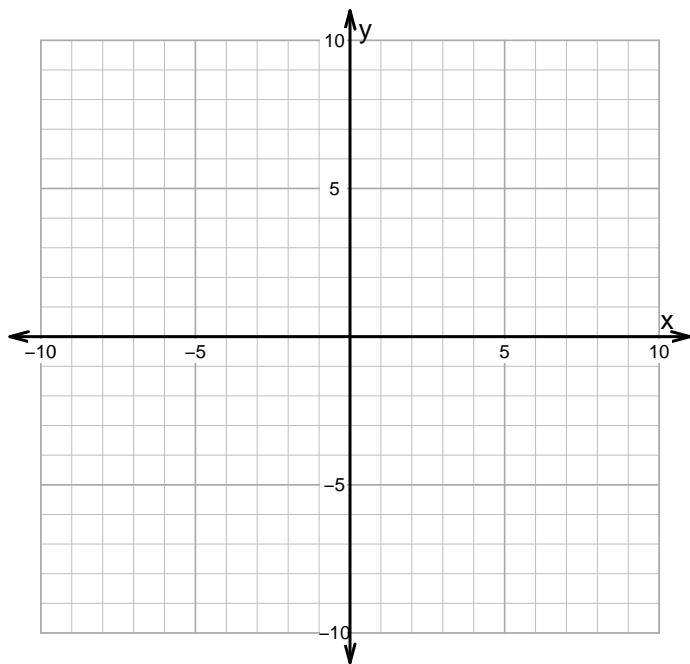


- What is the equation for the curve shown above?

**Question 6 (20 points)**

Make an accurate graph, and describe locations of features.

$$y = -3 \cdot |x + 5| + 6$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	